

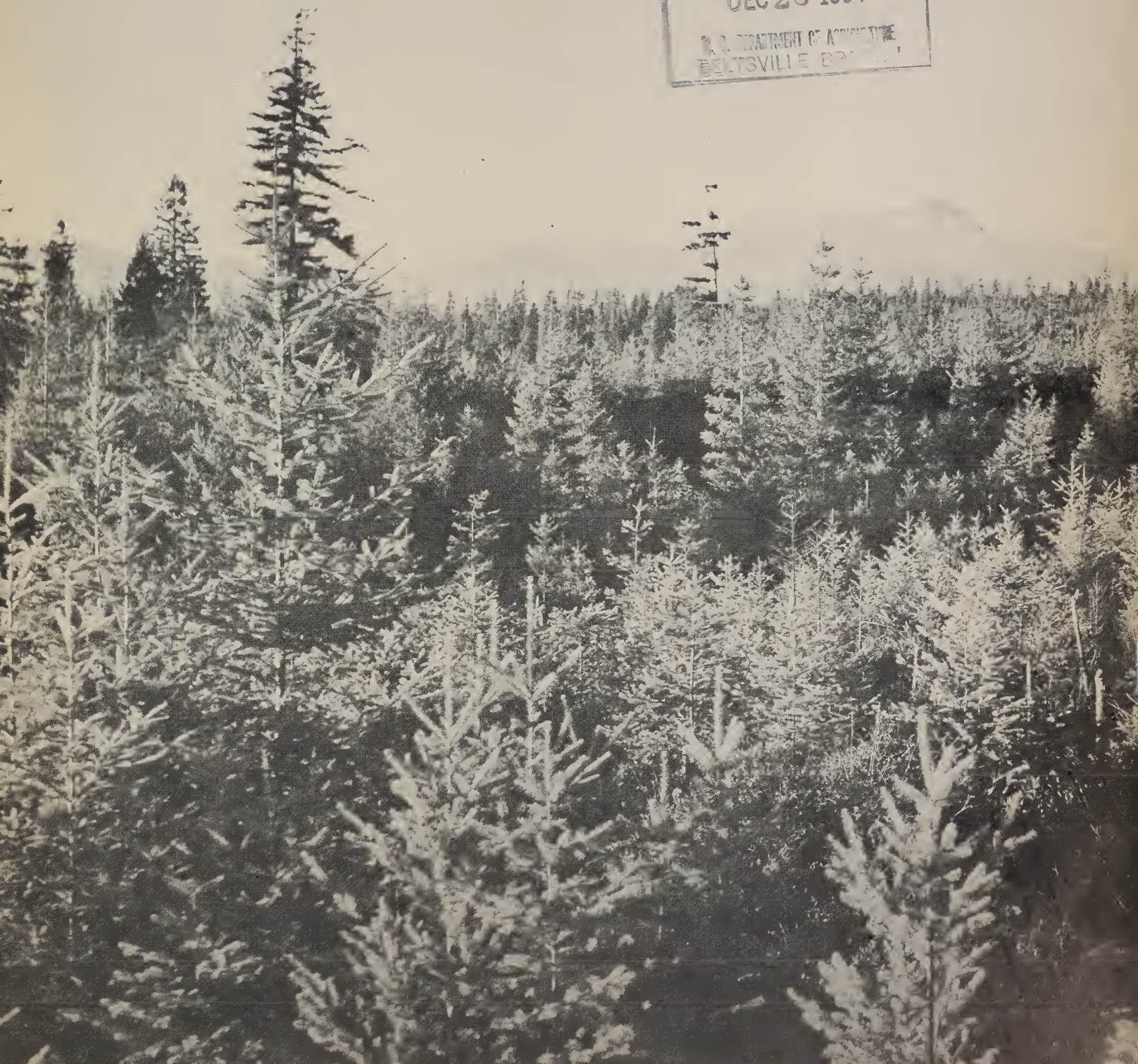
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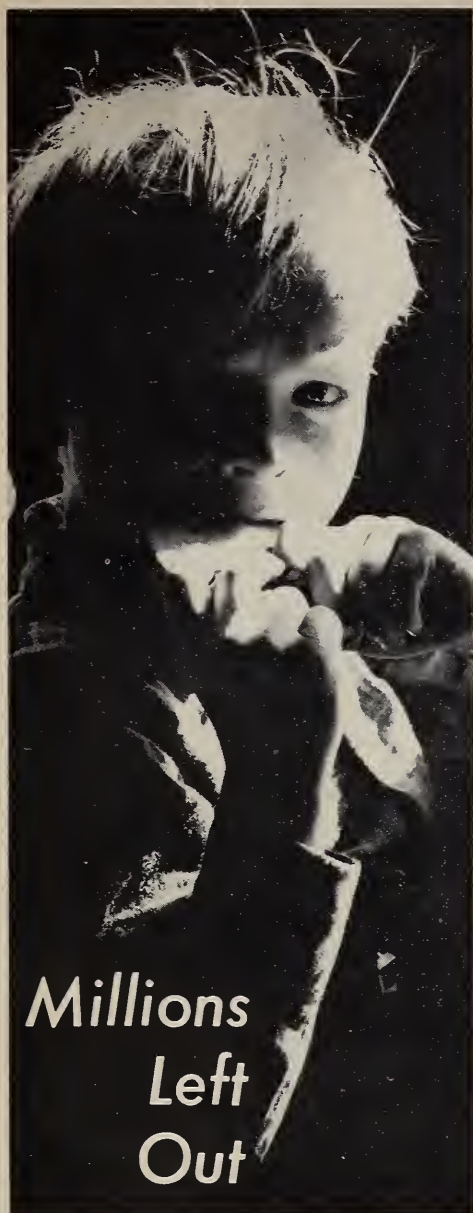
Cover Page

Machines can never appreciate the beauty of Christmas trees like those shown on this month's cover, but they might some day measure the colors in Christmas trees as they now do for other agricultural products. Cotton, tomatoes, eggs, and other products are now commercially selected on the basis of external or internal color by machines developed by the U.S. Department of Agriculture's Agricultural Research Service.

Editor, JAMES A. HORTON

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able to obtain lunches free or at minimal cost because of special assistance provided for the first time from cash and U. S. Department of Agriculture food donations to selected needy schools.

"This is barely a start toward our goal of a nutritious lunch for every child, regardless of his ability to pay," Secretary Freeman said. "Nevertheless, behind these figures are many dramatic stories of unusual efforts and imagination on the part of educators and community leaders."

These people demonstrated that children can be adequately fed even in the most adverse conditions, when local people cooperate to provide the necessary manpower and facilities, and when the State and Federal governments can give them adequate assistance in providing the food.

Last year, through experimental programs in Kentucky and Virginia, lunch programs were started in some 315 isolated one- and two-room schools where a large percentage of the children could pay only a few pennies or nothing at all. With simple equipment such as hot plates, the children received adequate lunches from foods donated by the U.S. Department of Agriculture, supplemented by locally purchased milk, bread, and fresh produce. These local purchases were made possible when the State allowed needy schools a larger-than-usual share of the National School Lunch funds it receives from the Federal Government.

These efforts are being expanded this year. For example, in Virginia's Buchanan, Dickenson, and Wise counties alone, 42 more schools with a total enrollment of 2,400 children are receiving lunches for the first time. Individual school boards contributed \$25 per school to buy basic equipment; and where necessary, local rural electric cooperatives have run electric lines to the schools. Teachers and parents pick up the milk and bread for these schools, and children usually bring their own eating utensils from home.

Also, State and local leaders have laid the groundwork to extend the school lunch program for the first time to about 1,000 children in some 30 schools in Fayette and Lincoln counties, West Virginia.

The 70,000 schools participating in the National School Lunch Program account for about 35 million pupils, or three-fourths of the total enrollment in elementary and secondary schools. However, only half the children in these schools take advantage of the nutritional bargain available to them.

Frequently the cause of non-participation is that youngsters who need lunches most can't afford the usual payment; yet they and their families may be reluctant to ask whether they are eligible for assistance. The Department is working closely with State governments to find ways to help participating schools encourage all children to participate in the school lunch program, and particularly to help them serve the needy children.

This year Congress provided an additional \$9.4 million for the National School Lunch Program, making available a total of \$191.4 million for fiscal year 1965. Some \$120 million is apportioned to the States in cash and approximately \$60 million is spent by the Department for supplemental foods to help schools meet nutritional needs. The Federal appropriation in cash and food provides an average contribution to schools of about 5 cents per lunch served. In addition, donated foods from the USDA's price-support and surplus-removal operations, distributed to schools, are worth another 6.5 cents per lunch.

Under usual circumstances, this Federal cash and food assistance plus State and local contributions enable schools to serve lunches costing nearly 50 cents at a charge of 25 to 30 cents to the children. Federal contributions also make it possible for schools to serve about 10 percent of the total lunches free or at below-average cost to needy children.

However, in areas of concentrated poverty, many schools cannot sponsor a lunch program in which a high percentage — sometimes a majority — of the children can pay little or nothing.

To meet this situation, the Agricultural Marketing Service three years ago authorized States to provide cash reimbursement out of National School Lunch funds above the maximum 9-cent rate previously allowed. Some States now grant as much as 15 cents per lunch to schools in areas of serious poverty. About half the States now use a variable rate formula that takes relative need into account in determining the cash reimbursement rate for individual schools.

Several States and territories have also added State funds to the Federal allocations to supply lunches free to needy children or at reduced prices to all children. These are: Delaware, Hawaii, Louisiana, Massachusetts, Minnesota, New York, Rhode Island, Utah, West Virginia, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and American Samoa.

A RECORD 17 million children are taking part in the National School Lunch Program, but millions of children are still left out. In fact, two-thirds of our Nation's school children are still not getting complete lunches every day at the low prices made possible by the National School Lunch Program. "Many of these children are the ones who need good lunches the most," Secretary of Agriculture Orville L. Freeman said recently.

As many as 6.5 million children go to schools without any lunch service at all. These schools are frequently the older ones without kitchen facilities, in low-income sections of large cities or small country schools.

Last year, some 65,000 children in "pockets of need" in 14 States were

Fruit and Vegetable Marketing

MORE THAN a billion dollars worth of fruits and vegetables are marketed each year under Federal marketing orders. Each of the 43 marketing orders now in effect was tailored to fit the particular marketing needs of the growers and shippers who designed and operate it, and approved by at least two-thirds of the growers voting in a referendum or by producers of two-thirds of the total volume marketed. These photos show marketing orders in action—as the industry puts them to work in the daily process of getting fruits and vegetables to market.



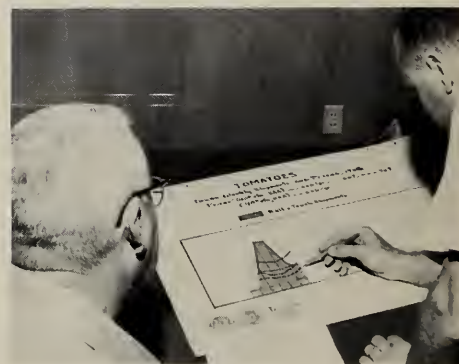
N-53981 — The manager of the Washington sweet cherry marketing order, Dee Smith, and Frank Harmon, chairman of the industry administrative committee, talk with orchard owner John Grubb about the size and maturity of the cherry crop. Their marketing order specifies minimum size and quality for cherries shipped—to make sure their best fruit represents them in the marketplace.



N-53905 — The Washington Peach Marketing Committee—made up of growers and shippers nominated by the industry—meets. Dee Smith, also the manager of the peach marketing order, here talks about the market situation for peaches.



Gathering accurate production and marketing information is one of the most important factors in operating a marketing order—and it isn't always easy. An aerial survey each year tells the grape industry how many trays of raisins have been laid out in the sun to dry. Surveyors use magnifying glasses to count trays on the enlarged aerial photos (dark-striped fields). Then the raisin industry sponsors a ground survey to get the dry weight of raisins per tray.



N-51984—One of the important steps in effective marketing is analyzing your performance. Here Frank Gross, manager of the South Texas tomato marketing order, discusses tomato shipments and prices with Bill Cremins, U.S. Department of Agriculture field representative. The USDA's Agricultural Marketing Service administers all Federal marketing orders.

Orders in Action



N-52003 — Cull lettuce doesn't bring the grower much money — but it can take the edge off the lettuce market. Texas lettuce growers, under their marketing order, set minimum quality requirements, and lettuce that fails to qualify is kept out of the marketing channels.



N-51934 — Roy Russell (above in center), a grower member of the South Texas Carrot Committee, checks out a point of marketing order operation with Ken Martin (left), order manager, and Bill Cremins, AMS field representative.



N-54010 — Truck driver leaving the production area has inspection certificates to show that this load meets marketing order's quality standards.

N-51988 — Keeping accurate records (at right) is another important function of the marketing order staff. Inspection certificates show how much, and what quality, has been sold.



N-51996 — South Texas citrus shippers (below) make sure they put their best fruit forward — by having Federal-State inspection of all shipments to make sure the fruit meets the industry's minimum requirements. Here inspector Henry Den grades grapefruit while marketing order manager Frank Gross talks quality with packer Charles Rogers.



Custodial Accounts — Protection for Producers

By Harry L. Williams

A FARMER sells a load of fat hogs through a nearby terminal market — a cattleman sells his annual crop of feeder calves through a local auction.

Neither man wonders whether the check he receives will be honored by the bank — he automatically assumes that it will.

This confidence is due largely to the reputation built up by the individual market agency.

It is also an indirect result of the financial protection afforded livestock producers under the Packers and Stockyards Act — chief among these being the custodial account regulation which outlines the proper handling of shippers' proceeds.

The Act's primary purpose is to prevent monopolization of the livestock marketing and meat packing industries, and to assure fair competition and fair practices. It was designed to safeguard producers against receiving less than the true value of their products, and to assure consumers that prices charged for meat are formulated under competitive conditions.

The concept of the custodial account to protect shippers' proceeds was established as one of the most important financial protections under the Act.

This concept is based on business law.

A livestock market agency — be it an auction market or a commission firm selling livestock on commission on a terminal market — operates in the eyes of the law exclusively as the seller's agent.

Its primary responsibilities include representing only the seller in the sale of his livestock, collecting the sale proceeds from the buyer, and paying these proceeds to the seller less a small charge for the services rendered.

These sale proceeds, therefore, are not the "property" of the market agency. They are merely being held "in trust" for their rightful owner — the seller.

As a result, the market agency must give the seller a full accounting of all money collected from the sale of his livestock. This can only be done properly if the sale proceeds are kept

separate from the funds belonging to the market agency, and so designated that a "trust" is apparent. Hence, the need for "custodial accounts for shippers' proceeds" is well established.

Years ago, many livestock market agencies operating on the terminal markets recognized the added protection which custodial accounts provided for their customers.

More recently, as livestock auction marketing gained in importance, many auction owners likewise recognized the value of custodial accounts.

In July 1961, a group of livestock producers met in Washington, D.C., to review the administration of the Packers and Stockyards Act by USDA's Agricultural Marketing Service.

Out of this conference came the recommendation that the P&S Act regulation covering the handling of shippers' proceeds be revised and strengthened. The producers believed that all market agencies handling shippers' proceeds should be specifically required to establish and maintain a separate custodial account for these funds.

Following the conference, AMS officials surveyed the industry and found that approximately 84 percent of the market agencies operating on terminal markets maintained custodial accounts, and that 31 percent of the livestock auction markets had such ac-

counts. Further, they found that at least two States — Idaho and Michigan — require by law that custodial accounts for shippers' proceeds be established and maintained.

Packers and Stockyards Division officials then proposed in October 1961 to amend the Act's regulation in line with the conference recommendation. Interested persons were invited to submit comments.

Many of the comments came from market agencies which had been maintaining custodial accounts for several years, and strongly advocated such accounts as an added protective measure for the livestock producer. Producers felt the proposal would help prevent the misuse of their funds while in the temporary possession of their agents.

As a whole, the livestock industry strongly supported the proposal. Consequently, it was adopted by USDA and became effective July 1, 1963.

To comply with the regulation, a market agency must make arrangements with its bank for a separate checking account. The market agency and the bank must agree that only checks written upon the custodial account will be honored by the bank with funds from that account.

Checks written on this account normally carry the designation "custodial account" or "custodial bank account for

Proper handling of custodial accounts for shippers' proceeds — in accordance with the P&S Act — insures that the check this producer is receiving from the sale of his livestock will be honored at the bank.



shippers' proceeds." Such a designation assists bank employees in honoring for payment from the custodial account only those checks which are drawn on that account.

As added assurance, many market agencies have found it to their advantage to have the custodial account checks printed in a different color from the checks used with their general bank account for the payment of regular business expenses.

The market agency must promptly deposit into the custodial account all funds received from the buyers of consigned livestock. If a buyer is delinquent in making payment, the market agency must put enough of its own money into the custodial account to make up the difference.

The custodial account can be drawn upon only for the (1) payment of net proceeds of sales to consignors; (2) payment of lawful marketing charges by the market agency on behalf of the consignor, and (3) payment of commission fees due the market agency as compensation for its services.

Further, the market agency must keep precise records that will disclose at all times the names of the consignors, the amount due and payable to each consignor from funds in the custodial account, and the handling of funds in the account for the payment of marketing charges and commission fees.

When a market agency maintains its custodial account properly — that is, the records reveal the exact interest in the account of each shipper — another Government agency will help protect these funds. The Federal Deposit Insurance Corporation will insure the funds of *each* shipper of livestock when deposited in an insured bank to the maximum of \$10,000, instead of the regular \$10,000 maximum on the entire bank account.

Thus, a market agency which properly maintains its custodial account in accordance with the P&S Act will always have sufficient funds on deposit to pay all consignors promptly. This is the market agency's responsibility as an agent of the seller.

This financial protection under the Packers and Stockyards Act helps to build the reputation of the market agency. And, this is what the producer relies upon when he accepts without question his check for the sale of his livestock.

(The author is Chief of the Stockyard Branch, Packers & Stockyards Division, AMS.)

Tobacco Stocks Reports

By Al Doub

IN 1912, the tobacco industry was beset with unrest and dissatisfaction because of suspected control and manipulation of tobacco markets. This led to proposals for accurate reporting of stocks of leaf tobacco in the hands of manufacturers and dealers.

As a result, Congress authorized publication of a tobacco stocks report. This publication, known today as the Quarterly Tobacco Stocks Report, is still considered a valuable aid to the tobacco industry, because it furnishes reliable statistics for determining the disappearance, supply and immediate requirements for tobacco in the U.S.

This stocks report also led indirectly to the establishment of specific authority for official standards for tobacco.

When tobacco stocks reports were first authorized (in 1912), Congress gave the responsibility for them to the Bureau of the Census. At first the reports were published semi-annually, but in 1917 they became quarterly reports, as they are today.

At the beginning, also, tobacco stocks were listed in the report on the basis of a broad grouping of kind or type of tobacco — such as Burley, bright flue-cured, fire-cured, etc.

By 1929, the tobacco industry realized that to be really effective, the reports must do more than just report stocks of tobacco by a loose definition of type. Also needed were statistics on quantities of tobacco of varying qualities and types of leaf. In other words, the reports must include official standards or grades of tobacco in order to be of most value to industry.

There were no official grades for tobacco at this time, so Congress passed the Tobacco Stocks and Standards Act in January 1929. This law did several things. It:

(1) Transferred responsibility for publishing the Quarterly Tobacco Stocks Report from the Bureau of the Census to the U.S. Department of Agriculture.

(2) Directed the USDA to collect and publish statistics on the quantities of leaf tobacco in the possession of dealers, manufacturers and owners (other than the grower) on January 1, April 1, July 1 and October 1 of each year.

(3) Authorized the Department of Agriculture to "establish standards for

the classification of leaf tobacco" by type, quality, color and grade, which must be reported by owners of tobacco for the stocks report.

The report today is published by the Tobacco Division of USDA's Agricultural Marketing Service. Each quarter the Division sends a questionnaire to dealers in leaf (manufactured) tobacco and to manufacturers producing at least specified amounts of products. The list of persons receiving the questionnaire is largely determined from Internal Revenue Service records. Each individual report is treated confidentially and published statistics include only the totals for the entire industry.

The Tobacco Division reviews each report or "reporting schedule" for mathematical accuracy and for possible error. (Rarely, the schedule must be returned to the firm for clarification, but the industry has an excellent record of interest and cooperation.) Then the reports are placed on data-processing cards, and the final results are tabulated electronically. These industry-wide statistics, broken down by type of tobacco and, when applicable, by quality grouping, are then published in the Tobacco Stocks Report.

Stocks are listed in the report both on a "reported-weight" basis and on a "Farm-sales-weight" equivalent basis. Reported-weight figures report the actual quantities of tobacco on hand. Farm-sales-weight figures adjust the actual quantities by adding "weight losses" (caused by stemming, drying and other handling operations of storage and manufacture) to the reported weights. These farm-sales-weight figures are helpful in determining the tobacco situation, where supply and disappearance are compared with production. These stocks are basic information in determining the supply and indicated consumption for the different kinds of tobacco.

Tobacco stocks reports perform a valuable service in maintaining industry stability, by making available reliable and uniform supply information — and eliminating speculation and "second guessing" about supplies and disappearance.

(The author is Chief of the Reports and Analysis Branch, Tobacco Division, AMS.)

Self-Service Centers for USDA-Donated Foods

FOOD assistance for needy families is now provided in locally administered self-service centers in the State of Washington and the District of Columbia. Program administrators find them effective in several ways.

Recipients of U.S. Department of Agriculture donated foods can be more selective about the foods, choosing only the items they need from among the available foods. Labor in handling the commodities is reduced because of self-service. Accounting and program control are made easier.

The commodities, taken from price-support and surplus-removal stocks, are distributed to eligible needy families through cooperative arrangements between the USDA's Agricultural Marketing Service and State and local distributing agencies. Eligibility is determined by local welfare agencies

and based upon family size and income.

Commodities now available from USDA include dry beans, canned meat, bulgar, butter, cheese, corn grits, corn-meal, dried eggs, flour, lard, dry milk, rolled wheat, peanut butter, and rice.

Since 1961, the State of Washington has been helping recipients in 38 counties by distributing USDA-donated foods in 32 self-service units located throughout the State. Families pick up food items they need from among the 15 available commodities, much as they would in regular retail food outlets.

As a recipient enters a self-service center, his authorization card is checked. He then takes a cart, picks out the donated food from shelves and bins, and checks out with the distribution clerk. Food items, family allotment, and other details are examined, adjustments made if necessary, foods are bagged,

and the recipient takes them home. Home economists conduct demonstrations at regular intervals at the centers, and families learn better ways to prepare nutritious, good-tasting meals with their donated foods.

Last year, 109,639 public assistance and low-income recipients used the Washington State self-service units. In addition to regular operations, a truck delivery service makes food available to people in remote localities.

The District of Columbia operation began in July 1964, supplementing the older centralized system. The center is patterned after the Washington State self-service approach.

This year, about 30,000 individuals have been served by the D.C. program, with about 5,000 persons benefiting directly from the self-service unit. Another 25,000 received their foods at

the central warehouse or from a volunteer trucking service under contract with the D.C. Government. The aged or disabled and other shut-ins, who cannot get to the center, are greatly assisted by the truck deliveries.

The present location of the self-service center allows recipients in that area to get their foods more conveniently. Recipients enjoy a larger sense of participation in the program and can be selective about the foods they receive.

Mr. A. R. Rosin, Controller of the District of Columbia Department of Public Welfare, sums up the operation this way:

"The self-service center is highly successful. Participation is high and people are pleased. Recipients can maintain their morale and dignity. That can't be underestimated."



Below, learning to cook low-cost meals . . .

Checking out

A typical distribution center (top), and a new self-service one (below).

The new look



Pea Beans Ship Better in Bulk

PEA BEANS shipped in 100-pound burlap bags are more likely to be damaged than those shipped in bulk by truck or insulated railcar, according to tests made by the U. S. Department of Agriculture.

Although overall damage may be 3 percent or less, damage to bagged beans at the bottom of a load was as high as 15 percent in representative bagged shipments sampled by USDA's Agricultural Research Service. The split and cracked beans must be screened out by canners to maintain the high quality consumers demand in baked beans, soups, and other products made from pea beans.

Such losses could be reduced if the beans were loaded in bulk instead of in bags, according to tests made by ARS marketing researchers. Bulk shipments minimize rough handling and moisture changes that can damage beans handled in bags.

Best temperature and moisture control was obtained by shipping beans in insulated refrigerator cars customarily used for fresh produce. Efficient loading methods enabled the researchers to load the railcar with 80,000 pounds of beans in only an hour. Loading is much slower when beans are handled in bags.

Some modifications were made in the insulated railcar to permit faster unloading. Interior walls were lined with marine plywood to provide smooth, clean, splinter-free surfaces. Reinforced sloping floors were installed to permit unloading by gravity.

The insulated railcar was loaded through 10 top hatches. Researchers estimate that only four hatches would be needed if the car were loaded by an adjustable belt conveyor.

It was found in the USDA experiments that beans could be loaded in only an hour by using a hopper large enough to hold three or four dumploads from the scales. This permits continuous operation of weighing and cleaning equipment when a car is being brought into position for loading.

Shippers have hesitated to ship graded beans in bulk because of the risk of contamination by other grain, nails, splinters, and miscellaneous foreign material. However, this risk could be minimized if a railcar or truck equipped for bulk shipment of pea beans were used only for the one com-

modity during the shipping season, as was done in the USDA tests. This practice is also followed in bulk shipments of flour and sugar.

Sampling was once another drawback for bulk shipments of pea beans; standard grain probes cannot reach the bottom of a bulk load. A pneumatic probe developed by marketing researchers now permits rapid top-to-bottom sampling of bulk loads of pea beans.

In addition to tests with insulated cars, USDA investigators used non-insulated standard box cars for bulk shipments of pea beans. Beans shipped in these cars were moldy on arrival because of changes in temperatures and moisture levels in transit. Loading and unloading were not as easy with the standard cars as with the insulated refrigerator car equipped with sloping floors.

When the outside temperature fell to 10° F., beans in every bag in the

conventional shipment were frozen. Few of the beans in the insulated railcar froze.

Modified bulk shipments by tote boxes loaded in trucks were as satisfactory as those in insulated railcars. The steel tote boxes hold a ton of beans. Temperatures varied about 3 to 5 degrees, yet the moisture content remained at a safe 16 percent during shipment of the beans.

Less successful were earlier tests with wood tote boxes shipped by truck. Canners did not accept delivery of beans in these boxes because the boxes were not sturdy enough to withstand damage when handled by forklift trucks.

Details of the shipping tests are given in ARS-51-3, "Comparison of Bag and Bulk Shipments of Dry Edible Pea Beans." Single free copies are available from the Market Quality Research Division, ARS, USDA, Hyattsville, Md. 20781.

The 10 hatches of this railcar are being loaded with bulk pea beans from an overhead elevator spout. Bagged beans are more likely to be damaged.





Two for One – Marketing Orders for Oranges

By Norman C. Healy

IF ONE marketing order doesn't do the job, try two of them! That may sound like an unusual approach, but for the California-Arizona orange industry it was the right one.

Unhappy with a Federal marketing order that covered both Valencia and Navel oranges, California-Arizona orange growers have been operating separate marketing orders for the two types of oranges since 1954 — and finding that two orders suit them fine.

Marketing order programs for fruits and vegetables, designed to improve grower returns by limiting the qualities or quantities of produce shipped, are authorized under the Agricultural Marketing Agreement Act of 1937.

California-Arizona orange growers had been among the first to adopt Federal marketing-order-type programs when they were originally authorized in 1933. By the early 1950's the industry was operating under a single Federal marketing order which provided for regulation of both the sizes of fruit that could be shipped and the rate of flow — that is, limiting the number of cars of oranges that could be shipped each week.

But a basic difficulty in operating the single marketing order always arose during that part of the season when shipments of Valencias and Navels overlapped. How much of the market should each variety get? Historically, Navel shipments had tapered off at the end of April, with Valencias beginning in volume in May. But increased plantings of Navel oranges meant that the Navel shipments lingered on . . . further and further into the Valencia season.

To complicate the situation, increased orange production in Florida and the growing importance of frozen concen-

trated orange juice meant that the California Valencia crop now had more competition for the summer orange market. Valencia growers saw more and more of their crops going to processing outlets (at lower returns) and wondered if the marketing order had played a role in this.

In a grower referendum early in 1952, nearly half of the Valencia growers voted to terminate the program.

Most of the Navel orange growers wanted to keep it, and less than half of the growers — in total — voted to terminate. But USDA's Agricultural Marketing Service, which administers Federal marketing orders, was convinced that, with a whole segment of the industry alienated, the order could no longer function effectively. Industry-wide cooperation is too important to the success of a marketing order. The program was terminated in March 1952.

It didn't take the orange industry long to realize how useful their marketing order had been. The crop in 1953 was big — and trying to market a bigger-than-usual crop without the marketing order they'd been used to was a trying experience.

Navel orange growers suffered most. Navel shipments rose to 15.1 million boxes, contrasted with 10.7 million the previous year. As a result, the season average on-tree price dropped from \$2.40 to \$1.63 per box. With shipments nearly 50 percent larger, grower returns for the 1953 Navel crop were \$27.4 million, down from the \$29.9 million realized from the smaller 1952 crop shipments.

Aside from prices, growers and shippers alike were suddenly faced with the problems of operating without the marketing information that the marketing order program had been giving them for so many years . . . how much of the crop each handler had available for shipment, how many cars were go-

ing to be shipped by each firm during a given period.

Suddenly everybody was operating in the dark. They didn't like it.

In April 1953, USDA was asked to hold a hearing on a new marketing order proposed by the Navel orange industry. It had essentially the same provisions as the old order but covered only Navel oranges. It was approved by the Navel orange growers in a referendum, and by USDA, and went into effect in September 1953.

As a matter of fact, the Valencia growers weren't far behind in getting another marketing order to cover *their* crop. Theirs went into effect in March 1954. Again the provisions were about the same as those in the old order, providing for rate-of-flow and size regulations.

Since 1954, the two marketing orders have been functioning successfully side-by-side. The two administrative committees meet independently to decide how many cars they'll ship during the overlapping season, and this seems to work fine.

There is no longer the friction that used to develop when the allocating was done by one committee.

Moreover, the cost of operating two orders instead of one is no greater. The administrative committees employ the same manager, who handles both orders from one office, with a single staff and field estimating crew.

It proves once more the importance of having the whole industry behind a marketing order for maximum effectiveness, as well as tailoring the order to the needs of the industry. If it takes two orders instead of one, that's all right too. Ask the California-Arizona orange growers.

(Mr. Healy is Chief of the Fruit Branch, Fruit and Vegetable Division, AMS.)

Shipping Fresh Beef To European Markets

AMERICAN beef will reach overseas markets in better condition if hung from new demountable racks developed by the U.S. Department of Agriculture for use in refrigerated compartments on ships. The new racks were developed by B. Hunt Ashby of USDA's Agricultural Research Service.

Refrigerated compartments can hold more beef when it is suspended from the new racks than when stacked four or six layers high on the floor. This heavier payload should bring lower costs per pound of beef, marketing researchers say.

When compartments are used for other cargo, the racks can be dismantled and removed. Little storage space would be required for racks when not in use.

ARS scientist Karl E. Hoke examined fresh beef shipped from New York to Holland by both the stacked and the new methods, and found that the racks maintained the beef in better condition. Six-layer stacks of fore-and-hind-quarters were severely compressed by the time the shipment reached Europe. In some instances, a beef round which was an original 8 inches thick was compressed to 4 inches. Stacking of the beef reduced air circulation, adversely affecting the quality of the meat.

In contrast, those inspecting the meat in Holland remarked that beef hung from the racks arrived in the best condition of any fresh meat shipment received at the port. Even when rough weather was encountered during shipment, the racks satisfactorily withstood stress from the pitch and roll of the ship, and the beef quarters remained in place on their hooks.

Meat used in the tests was delivered to U.S. Army installations, but the same successful results with the racks could be obtained when used with commercial meat shipments to European markets.

Several types of racks were tested. The best results were obtained with a demountable rack that provides room for a layer of carcasses on the floor of the compartment. This arrangement permitted use of about 85 percent of the available cargo space in holds in which the racks were tested. Only 60 percent of the available space in the holds was used when beef was stacked six layers high.

The demountable rack was made with galvanized steel pipes supported by wooden frames on opposite ends of the compartment. Wooden props also supported the pipes midway between the frames. Standard transit meat hooks were used to suspend the car-

casses from the pipes.

Purchase price of the beef, plus shipping charges from St. Louis, Mo., to Paris, France, were just under 44 cents a pound, when the best rack system was used. Duty, taxes, insurance, and inspection costs would raise this total somewhat in commercial shipments. Military shipments used in the tests were not subject to these additional charges.

Even with somewhat higher costs, the shipment would have been financially worthwhile for a commercial market because at the time of the study beef of the same quality as that in the test shipments sold for about 55 cents a pound, wholesale, on the French market.

Other tests were made with beef hung from meat rails in two refrigerated van containers. The beef was purchased in St. Louis, and carried by rail and ship to Paris. One van was loaded with 125 and the other with 127 hind-quarters. About 40 percent of the meat in both vans was from cattle slaughtered the day prior to loading. This meat was not thoroughly chilled.

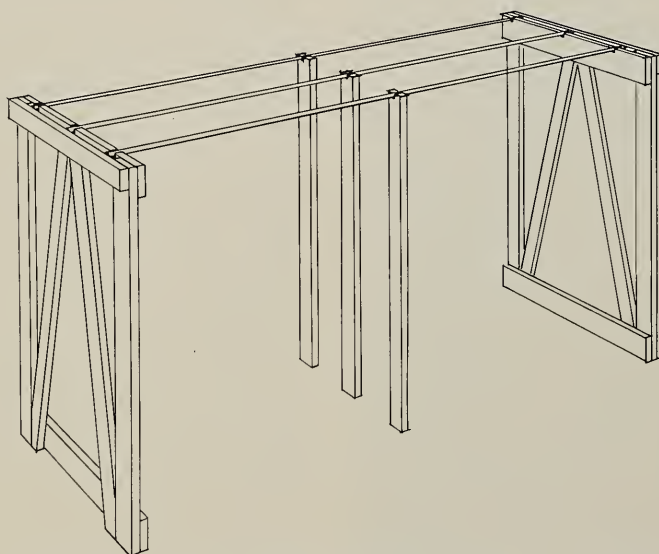
As soon as the beef was loaded in one of the vans, 250 pounds of dry ice was added to supplement the van's refrigeration unit. Beef in this van arrived in France in marketable condition 16 days after it left St. Louis. Meat in the other van was unmarketable when it arrived in France.

Shipping costs at the time of the van tests were about 10 cents per pound of beef. Costs could have been reduced about a cent a pound — and heavier payloads carried — if the meat rails were placed closer to the ceiling, allowing room for a single layer of beef on the floor of the van.

Costs could be further reduced if the volume of van shipments increased. For example, one van firm reported that charges would be reduced by \$200 to \$300 per van if as many as 30 to 40 vans are used per month.

Researchers also explored the possibility of exporting beef in foreign flag vessels equipped with meat rails, and in banana boats. In both cases, the ships were not routed to ports that would serve origin points and export markets for American beef.

Details of the preliminary study may be obtained from Transportation Research Branch, Transportation and Facilities Research Division, ARS, USDA Hyattsville, Md., 20781.



A sketch of the new meat rack developed by USDA's Agricultural Research Service for use with refrigerated beef. It enables ships to transport heavier payloads



Above, beef carcasses are hanging on the USDA-developed rack. Below, the refrigerated van container used in test shipments of fresh beef delivered from St. Louis, Mo. to Paris, France. The van holds 125 to 127 hindquarters.



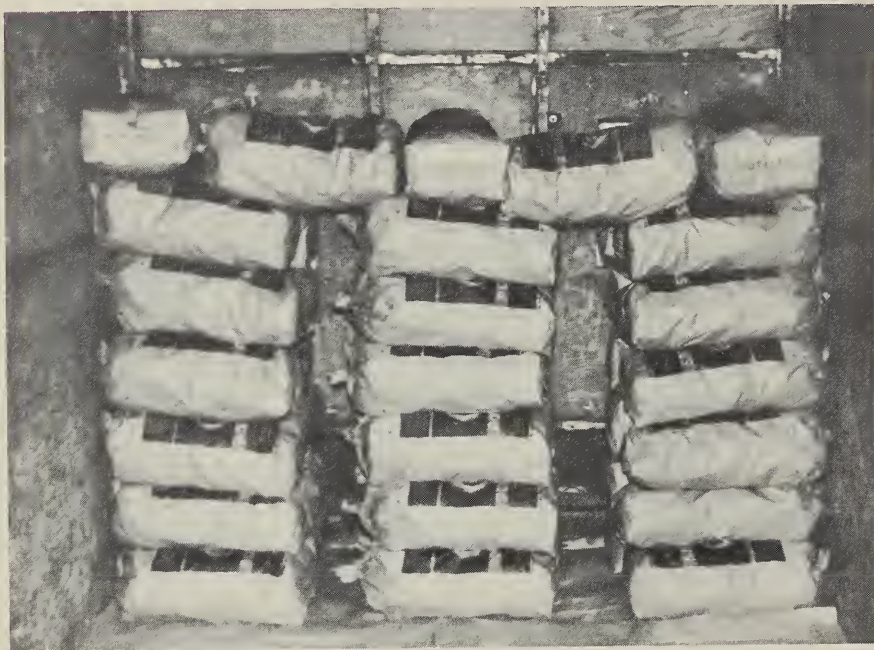
Market News

Office Relocated

LIVESTOCK market news work formerly conducted at Atlanta has been transferred to Thomasville, Ga., and combined with market news work there. The combined office will serve Georgia and Florida. Since this is a cooperative Federal-State program, the move is expected to result in a savings to both the Federal and State governments without any reduction in the service. James C. Gaither continues as Federal coordinator for the Florida program, and Ernest W. Morgan has transferred from Baltimore to Thomasville to coordinate livestock reporting in Georgia.

Better Loading Patterns for New Potatoes

By Russell H. Hinds, Jr. and J. Kenneth Robertson



First or header stack, showing airflow pattern



All subsequent stacks

EXCESSIVE losses from overheating and spoilage of early crop potatoes during shipment can be reduced with new loading methods developed by marketing researchers in the U.S. Department of Agriculture.

New "airflow loading patterns" enable more air to flow through a truck load of bagged potatoes than do conventional tight-stack loading methods. Five new loading patterns, all of the same basic design, were developed by USDA's Agricultural Research Service.

Results of preliminary tests with the first of the loading patterns were reported in 1960. The other four patterns — for use with a variety of bags, and with vans of different interior dimensions — were developed and tested since 1960. Preliminary tests were limited to ventilated shipments. Subsequent research indicates that all five loading patterns can be used in refrigerated shipments too.

Losses from overheating and spoilage can be excessive even when conventional tight-stacked loads are refrigerated during shipment, because not enough cool air circulates through the load. Large differences between the temperature of the air and that of the potatoes can also cause moisture to condense on the potatoes after they're unloaded, leading to later losses.

Although the new loading patterns provide more open space for air to circulate than conventional loading methods, trucks can carry a full payload. Potatoes can be loaded about as fast with the improved stacking methods as with conventional tight-stack methods.

The five patterns were developed for loading bags in trucks of any size. Tests — made under commercial shipping conditions — show that the loads remain stable and that neither containers nor potatoes are damaged.

Airflow loading patterns will allow potatoes to reach about the same temperature as the outside air. To sufficiently cool the potatoes by ventilation, the outside air should be appreciably cooler than the potatoes, however. Some refrigeration should be used with the new loading patterns in hot weather.

Spoilage and wet paper sacks can be a problem even if potatoes are cool when loaded. For example, moisture condenses on cool potatoes when they're unloaded at a destination where the temperature is higher than it was where the potatoes were loaded. The new loading patterns help prevent condensation by allowing the potatoes to reach a temperature close to that of the air at destination. Potatoes in a conventional tight-stacked load would re-

main cool, and moisture would condense on them after they were unloaded.

All the new loading patterns follow the same basic design. In ventilated shipments, the bunker vent is closed so that outside air flows from the front hatch down to the bottom of the bunker and into the load. Bags in the first row are stacked to force the air into longitudinal channels (formed by the bags) running through the length of the load. Air leakage between bags allows some air to flow across the top of the load, also. The air then passes out the rear hatch, or vent.

In each load for all sizes of bags there are two basic stack patterns. One is for the first or adaptor stack at the front of the trailer. Bags in this stack are loaded three wide with two- to three-inch-wide vertical flues between them.

In the pattern for all remaining stacks, the bags are arranged crosswise and lengthwise so as to form a series of continuous channels extending to the rear of the trailer. When these stacks are placed together in the trailer, the vertical flues in the adaptor stack permit the circulating air to reach the longitudinal channels at each level of the load in all remaining stacks.

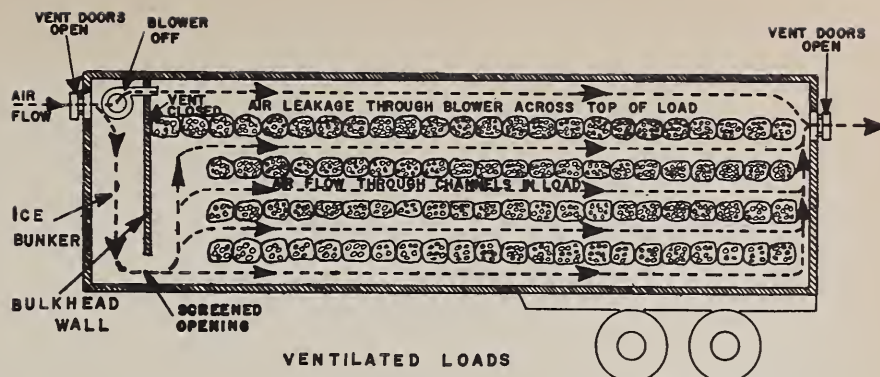
The top layer of bags in both types of stacks is stacked tightly from side-wall to sidewall. This arrangement ties the load together, stabilizing it crosswise in the vehicle, forcing air to move through channels in lower layers.

Variations of these basic patterns can be used for both paper and burlap bags. Five stacks separated by four air channels can be used in some cases. Some of the paper sacks were stacked as high as 10 layers, while the burlap bags were stacked five high.

In refrigerated loads, all vents are closed and a fan forces cold air across the top of the load toward the rear of the truck. The air then passes down along the rearmost bags and is pulled into channels formed by the bags, and thence back to the front of the load. The air then passes through the bottom of the bunker and is recooled and re-circulated through the load.

Three airflow patterns were developed for stacking 50-pound paper sacks in trucks. The patterns can be used with four kinds of paper sacks, depending on the type of sack, and the interior width of the trailer. The other two loading patterns were developed for use with 100-pound burlap bags.

(The authors are members of the Transportation and Facilities Research Division of the Agricultural Research Service, USDA.)



Use of ice bunker in this ventilated load of potatoes is new. Research since 1960 indicates that all five loading patterns can be used in refrigerated shipments too, in which case the blower would be on and vents closed.



Rear stack, showing comparative stability during transit



The same rear stack upon arrival at destination

OFFICIAL BUSINESS

Moving Cotton Bales Faster and Cheaper

LARGE clamp trucks can move cotton bales faster and at lower cost than tractor-trailer trains often used to carry bales long distances at larger warehouses, according to a recent study by marketing researchers in the U.S. Department of Agriculture.

Clamp trucks that can carry 12 to 20 bales are recommended by Charles D. Bolt of USDA's Agricultural Research Service, for warehouses where bales are transported 1,000 feet or farther. To be economical, the trucks should be used with 10,000 bales or more annually. Because bales are handled at least two or more times, the trucks would be economical at warehouses that store about 50,000 bales annually.

Warehouses that store considerably fewer bales, or move them distances appreciably shorter than 1,000 feet, could transport them at lower cost by using tractors hitched to trains of four or more trailers. Each trailer can carry four bales. The high initial cost of the large clamp trucks makes a large volume and long-distance transport necessary for economical use of the trucks.

The clamp trucks can transport 100 bales in about a third of the time required for tractor-trailer trains for distances of 1,000 feet. This comparison includes the time required to load and unload bales on the trailers, or to assemble and disassemble the bales in unit loads for the large trucks. Two small, 3-bale clamp trucks would be used with both the large clamp trucks and the tractor-trailer trains.

Handling costs can be reduced about \$3,000 a year if 100,000 bales are moved 1,000 feet with a 12-bale clamp truck instead of with a tractor-trailer train.

Savings are even greater when large clamp trucks are used to transport 150,000 bales annually for distances of 1,500 feet. From about \$6,100 to

\$6,240 could be saved by using either a 12-bale or a 16-bale truck instead of a tractor-trailer train.

Costs would be slightly lower with the 12-bale truck because its costs are lower than those of the 16-bale truck for insurance, taxes, investment, amortizing the initial cost, and other ownership expenses.

The design and condition of the facilities may make it necessary to use trains instead of large trucks at some warehouses. In such situations, bales can be handled at lower cost by two than by a single tractor-trailer train.

About 500 hours can be cut from handling time when two trains instead of one are used with an annual volume of 150,000 bales moved 1,500 feet. Equipment costs were approximately

the same with one or two trains, but with two trains labor requirements were reduced 285 man-hours.

Estimated costs and labor requirements for the use of large clamp trucks and tractor-trailer trains for transporting cotton bales can be adapted for warehouses that have different cost combinations for labor, fuel, and other expenses. Cost and time comparisons are estimated for handling both flat and compressed cotton bales.

Details are given in ARS 52-1, "Transporting Bales of Cotton with Large Clamp Trucks." Single free copies may be obtained from Handling and Facilities Research Branch, Transportation and Facilities Research Division, ARS, USDA, Federal Center Building, Hyattsville, Md., 20781.

